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Purpose/Objective: To evaluate the effect of thoracic immobilization on patient positioning and compare effects on clinical outcomes.
Materials and Methods: Patients with lung or oesophageal cancer receiving curative intent thoracic radiotherapy were randomized to no immobilization (control) or to immobilization from 2001– 2008. The control group were positioned with a head rest and sponges to support the arms and shoulders. The group randomized to immobilization were positioned with either a vac-bag and T-bar handgrip system or a 'chest jig' which uses adjustable velcro bands to support the arms and elbows as well as adjustable handgrips. Orthogonal treatment verification images (TVI) were acquired on one or all of the first three days of treatment and weekly. The study investigators were blinded to the assigned immobilization during data collection.
Results: 77 patients were randomized to the control arm and 75 patients randomized to immobilization. The median number of TVI taken per patient was 7 (range 1-14). The median follow-up was 75 months. The mean deviation of the isocentre position from simulation to treatment was 7.1 mm in both the control and immobilized groups, with maximum isocentre deviations 29 mm and 25 mm in the control and immobilized groups respectively. 49.2% of patients in the control arm did not have any isocentre deviations > 10 mm, while 52.3% of the immobilized arm did not have deviations > 10 mm (p= 0.59). Permanent isocentre moves were made in 46.8% of the control group and 22.7% of the immobilized group which was statistically significant (p< 0.01). There was no difference in local failure between groups. Local failure occurred in 22.1% of the control group and 30.7% of the immobilized arm (p=0.23). There was no difference in median overall survival (OS) 18.4 versus 27.0 months in the control and immobilized groups respectively (p=0.08).
Conclusions: In this randomized study assessing thoracic immobilization, immobilization did not have an effect in mean isocentre position from simulation to treatment in patients undergoing thoracic radiotherapy. However, immobilization did reduce patients requiring permanent isocentre moves. The maturity of the data provided robust measurements on clinical outcomes and there was no effect on local failure or OS.

Poster: RTT track: Pre-treatment imaging and volume definition

PO-1084
Variability analysis among radiotherapists in delineation of the postsurgical lumpectomy cavity based on 4DCT

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Purpose/Objective: To investigate the interobserver and intraobserver variability among physicians in defining the lumpectomy cavity (LC) after conservative breast surgery.
Materials and Methods: Thirty-five patients after breast conserving surgery with placement of more than 5 surgical clips at lumpectomy underwent 4D-CT simulation scans. The LC was delineated on the end expiration (T50) scan. The data were then stratified according to CVS, CT slice thickness and surgical clips number. The dice similarity coefficient (DSC), interobserver and intraobserver variability (Δ_{intra} and Δ_{inter}) in different groups were evaluated and compared.
Results: LC size, CVS and the number of surgical clip, none of these variables were found to be significantly related to intraobserver variability (P>0.05). There was no correlation between the CT slice thickness and the interobserver variability (Δ_{inter}, DSC_{inter}) in the definition(r_{inter} (r=-0.485). The DSC_{inter} improved significantly as the LC volume increased (t=-2.343, P=0.025), and decreased Δ_{inter} (t=2.796, P=0.009). DSC_{inter} was found to be significantly increased if patients with CVS 3-5 vs. only CVS 1-2 (t=-3.051, P=0.004), and DSC_{inter} was positively correlated with CVS with a correlation coefficient of 0.451. The use of 7-9 surgical clips have no improvement in decreasingΔ_{inter} or increasing DSC_{inter}(t=-1.440,0.223; P=0.159,0.825).
Conclusions: Even patients who were implanted more than five surgical clips were found to have an improvement in LC delineation with a higher CVS value and bigger LC. The use of surgical clips more than 6 were not significantly improved the delineation of LC, and five to six surgical clips are likely to be adequate delineate the LC.

PO-1085
Comparison of clinical-radiological information in contouring rectal boost

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Purpose/Objective: In rectal cancer, higher total doses could improve outcomes. However, tumor location in the planning CT is challenging due to the low soft tissue contrast. Our goal was to compare the different tests of rectal cancer (MRI, planning CT and colonoscopy) and digital rectal examination (DRE) and assess the degree of agreement between them.
Materials and Methods: We reviewed imaging and planning data of 30 patients with locally advanced rectal cancer (Stage II-III). Planning CT slices were 0,5 cm thick, anal sphincter was marked and GTV was contoured according to the clinical-radiological information. All volumes were contoured by the same radiation oncologist and the DRE was